

C O N G E N I T A L P N E U M O N I A

A MORPHOLOGICAL STUDY OF
INFLAMMATORY CELLS IN FOETAL LUNGS



A thesis submitted for the degree

of

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in the

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by

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Venienti occurite morbo
-Persius

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CONCLUSIONS

- (1) In a series of 302 autopsies on stillborn foetuses and live-born infants, inflammatory cells were found in the lungs in 54 cases. Seventeen per cent. thus showed pneumonia.
- (2) To study the lesions which arose in the uterus or during birth, the lungs of stillborn foetuses and of infants dying within six hours of birth were examined microscopically. Twenty-eight cases in these two groups showed inflammatory cells or infiltrations in the lungs. In twenty-six, these changes can be described as congenital pneumonia. Sixteen, of the twenty-eight cases, were stillborn and twelve liveborn. Of the sixteen stillborn cases, two are regarded as being doubtful cases of pneumonia but in the other fourteen there were certain evidences of a foetal pulmonary inflammation.
- (3) The sixteen stillborn cases, including the two doubtful ones, were among the 172 stillbirths in the twelve-month period described. Taking the fourteen cases of certain pneumonia, the occurrence of congenital pneumonia is 8.1% of stillbirths in this series. Nine of the fourteen cases weighed more than 2500 gms.
- (4) Twelve of the neo-natal cases dying within six hours of birth showed pneumonia which is regarded as congenital. One of these cases was sent by an outside doctor. Thus, out of 110 neo-natal cases examined from the Women's Hospital, eleven (10%) died within six hours of birth and showed inflammatory changes in the lungs of congenital origin. In one of the eleven the lesions were actually only in bronchi.

Only three of these weighed more than 2500 gms.

- (5) The most certain evidence of foetal pulmonary inflammation is the presence of cellular infiltrations in the interstitial tissues. These were present, in varying degrees, in twelve of the stillborn cases and in all twelve liveborn cases. Such infiltrations occur either as scattered single cells or as small clusters of cells.
- (6) Interstitial infiltrations of inflammatory cells sometimes occur, as quite characteristic lesions, outside bronchioles. These were seen in seven cases, six of which were premature.
- (7) Leucocytes were present in the alveoli in twenty-three cases; in five of these the cellular concentration was minimal. It has been impossible to determine whether the origin of these cells is actually foetal or whether some of them, like the cornified epidermal particles, are aspirated. Out of 15 stillborn cases showing leucocytes in the alveoli some reasonable doubt exists in six that the cells are of local origin. Out of eight of the liveborn cases, doubt exists in three.
- (8) Evidences of an asphyxial type of death were found in the lungs of sixteen of the stillborn cases. In eight cases there were haemorrhages into the interstitial tissues or alveoli and in thirteen the alveolar capillaries or larger vessels showed congestion.
- (9) Peculiar necrotic changes in bronchiolar epithelial cells, most probably due to some noxious substance, which also causes inflammatory changes, were found in two of the liveborn cases.

- (10) Seven of the stillborn cases showed an associated degenerative change in the alveolar epithelial cells. This change consists firstly, in vacuolation of the cytoplasm to be followed later by desquamation of the cell, the cytoplasm of which subsequently becomes granular. These are well known results of maceration changes in the lung but would also appear, in some cases, to be caused by the same factors which cause inflammatory changes.
- (11) In all but four cases, aspirated epidermal particles were present in the lungs showing inflammatory changes.
- (12) Congenital pneumonia is held to be due to aspiration of some noxious substance in the uterus or birth canal. In two cases, there seemed to be the possibility that the lesions may have arisen as a result of blood stream infection; but the evidence is only in the types and distributions of the lesions.
- (13) Bacteriological investigations by staining sections of the lungs for organisms were considered unsatisfactory but organisms were found in the inflammatory exudate in one case which showed early maceration changes.
- (14) Prolonged rupture of the membranes was a significant associated feature in the stillborn cases and this applied particularly in foetuses weighing over 2500 gms. in which group the average duration was 65 hours. In the liveborn group the times were not accurately known but were mostly short. In one case the duration was 168 hours.
- (15) There were otherwise no constantly associated abnormal

obstetrical conditions but in twelve of the sixteen still-born cases showing inflammatory cells, labour was abnormal. Eight of these were long labours, mostly with a long duration of rupture of the membranes.

(16) In the liveborn group, long labour is not a prominent associated abnormal obstetrical condition. It was present in one case. Mostly, with a short duration of rupture of the membranes, premature birth was the principal abnormality. This was due, in four cases, to accidental haemorrhage; in one, to interference; in one, to severe anaemia; in one, to spontaneous premature labour, and in another there was a history of repeated miscarriages. In only one case was there evidence of maternal infection in this group. This is emphasised because of the absence, in some of the liveborn group, of the abnormal obstetrical conditions which characterised most of the stillborn cases.

(17) It is difficult to compare figures in this series with others to ascertain the effect of chemotherapeutic drugs on the incidence of congenitally acquired pneumonia. In some series the incidence of pulmonary infection in still-born or recently born liveborn cases has been accurately stated: Hook and Katz (50%), Kaldor (30%), possibly all congenital, Warwick (7.5%), Macgregor (13%), Benner (26%) and Helwig (less than 7%).

In this series 8.5% showed certain evidences of congenital pneumonia. Penicillin and sulpha drugs (or penicillin alone) were given to the mother before and/or during labour in fourteen of the twenty-eight cases which showed pneumonia subsequently in the foetal or infantile lungs.

While the figure of 8.5 is lower than some, it is not significantly different from the figures quoted by Helwig (1933) and Warwick (1934).

- (18) The incidence of congenital pneumonia is not higher in fetuses with other gross abnormalities. Only one of the stillborn congenitally malformed fetuses (out of fifteen) showed pulmonary inflammation. Five of the congenital pneumonia cases showed evidence of intra-cranial injury.
